Lat 41.35495 Lon -121.88990

United States Department Of Agriculture | Forest Service | Shasta-Trinity National Forests

Reply To: 3420 Date: ?17/June/91

Subject: Evaluation of Pine Plantation Mortality and Armillaria Potential in Oak Conversion, McCloud RD (FPM Report N91-9)

To: Forest Supervisor, Shasta-Trinity NF

On May 29, 1991, Dave Schultz and Sheri Smith, entomologists, and I visited with Bill Branham and Steve Funk, McCloud Ranger District, to examine two sites of concern. The first area was a ponderosa pine plantation where several mortality spots had recently been developing and the cause was unknown. The second area was being considered for development of a silivicultural prescription. The concern was the possible incidence and effects of armillaria root disease following removal of some of the oaks.

The ponderosa pine plantation was established on McCloud Flats in 1986. This area is known to develop pockets of annosus root disease, caused by Heterobasidion annosum, following harvest if stumps are not treated. In this plantation, there was no stump treatment. The district plans to precommercially thin the plantation in 1991.

Two pockets of dead and dying trees had been noted in the plantation by the District and it was suspected that annosus root disease might be the cause. Mortality had initially been observed this winter and trees appeared to be fading rapidly. All of the dead trees were still retaining their foliage and it appeared that symptoms had begun to be expressed within the last year. This rapid mortality is not typical of annosus root disease.

Examination of the dying seedlings revealed the presence of red turpentine beetles, Dendroctonus valens, around the root collars of several. The extent of gallery production was not sufficient to produce the degree of symptoms and it appeared these insects were simply taking advantage of severely weakened trees. Excavation of seedling root systems did not indicate infection by any root pathogen, including H. annosum. The roots did have several types of deformation. This included J and L roots and root balls. The deformities were those typical of improper planting. It is difficult to explain the decline solely on poor planting because of the circular pattern of decline. It is possible that other factors may also be involved that are providing additional stress on these trees. One such factor may be poor soil conditions because of the presence of a shallow lava flow, soil compaction, or some other impermeable layer. The decline is likely a result of the interaction of inadequate soil moisture, poor root development, and possibly shallow soil or soil compaction. No biotic causal agent was discovered.

The second area we visited was in the vicinity of Black Fox Mountain. The District is developing silvicultural prescriptions for future timber sales in

mixed oak-conifer stands and is concerned about the development of armillaria root disease, caused by Armillaria spp., following oak removal. The present stands have large components of oak, from 30 to 70 percent, with understories of sugar pine, white fir, Douglas-fir, ponderosa pine, and knobcone pine. The objective is to reduce the amount of black oak to about 10 ft^2/acre to satisfy wildlife objectives and to reduce competition with conifer growth. In addition to possibly leaving some existing conifers, planting will be required.

The oak stands we looked at appeared healthy and did not have any signs of decline. The conifers were generally healthy, although they were being suppressed by the oaks. Most of the sugar pine had some amount of infection by Cronartium ribicola, cause of white pine blister rust.